

MAR 19 1997

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Office of Secretary**Teleport Communications Group
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March 19, 1997

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, DC 20554

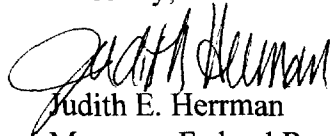
RE: Oral Ex Parte Communication: Pennsylvania Public Utility Commission
Petition for Expedited Waiver
CC Docket No. 96-98

Dear Mr. Caton:

On Wednesday, March 19, 1997, Paul Kouroupas, Vice President - Eastern Region Regulatory, and Judith Herrman, Manager - Federal Regulatory Affairs, of Teleport Communications Group Inc. ("TCG") discussed the above-referenced proceeding with Geri Matisse - Chief, Kent Nilsson - Deputy Chief, Erin Duffy, Renee Alexander, Scott Shefferman, and Greg Cooke of the Network Service Division of the Common Carrier Bureau. TCG reviewed, consistent with its comments in this proceeding, the implications of 10-digit dialing on competitive local exchange carriers. TCG also discussed the causes of and potential solutions to NXX code exhaust.

The attached material was used as an outline of the discussion. An original and one copy of this letter are being submitted in accordance with Sec. 1.1206(a)(2) of the Commission's rules.

Sincerely,



Judith E. Herrman
Manager, Federal Regulatory Affairs

cc: Geri Matisse
Kent Nilsson
Erin Duffy
Renee Alexander
Scott Shefferman
Greg Cooke

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RATE CENTERS

- A rate center is a geographic point identified by horizontal and vertical coordinates used to calculate distance for purposes of billing telephone calls.
- ILECs have established (and State Commissions have approved) the existing rate center configuration.
- Facilities-based wireline LECs must obtain a unique NXX code for each rate center.
- The unique NXX code associated with each rate center forms the foundation for all telephone company billing practices.

412 NPA

- There are 99 official rate centers in Bell Atlantic's service territory within the 412 NPA.
- TCG currently utilizes 42 NXX codes to serve 42 rate centers within the 412 NPA
- There are 57 rate centers within the 412 NPA that TCG physically cannot serve solely because TCG cannot obtain NXX codes.

SOLVING THE NUMBER CRUNCH

- There is a shortage of NXX codes, not a shortage of telephone numbers.
- The NXX code shortage is driven by the ILEC rate center design and industry billing practices.
- The NXX code shortage must be addressed immediately or facilities-based competition will be stagnant.
- The FCC should consider methods for relieving the number crunch:
 - TCG's Number Crunch Solution
 - Number Pooling and Service Provider Number Portability

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**Federal Communications Commission
Office of Secretary**

The Number Crunch: A TCG Solution - Revisited

January, 1997

TCG

**Teleport Communications Group
One Teleport Drive**

EXECUTIVE SUMMARY

The Number Problem

The United States is on the verge of a “number crunch” . . . telephone numbers are being “used up” too fast. At the December 2, 1996 meeting of the North American Numbering Council (NANC), the Central Office Code Utilization Survey predicted that all of the 690 usable area codes would be exhausted by the year 2025, ten years faster than the 2035 exhaust date predicted only a year earlier.

The cause of the number exhaust problem is not so much the tremendous growth of services using telephone numbers -- although that is one factor -- as it is the inefficient way that NXX codes are being assigned and utilized. An NXX code comprises the first three digits of the seven digit telephone number, which is preceded by an area code. Each NXX code contains 10,000 numbers. The current system of assigning and utilizing NXX codes wastes many of the 10,000 telephone numbers within the NXX blocks. The assignment of an entire NXX to a particular rate center, which is now the practice, effectively “strands” many numbers, because not all numbers in a block are actually used by subscribers. Then, as local telephone companies need new numbers to serve their customers, there are insufficient NXXs in existing area codes. New area codes are opened prematurely and unnecessarily just to provide additional inefficiently used NXX codes.

The artificial “number crunch” caused by the premature opening of new area codes has created controversy over whether the new area codes should be introduced through a traditional “split” (one code in any given geographic area) or an “overlay” (two or more codes in the same area). Either choice creates consumer dissatisfaction. However, no matter which choice is made, the inefficient assignment and utilization of NXX codes will hasten the day when no more area codes are available.

This problem cannot be solved simply by the addition of digits to existing numbers, for existing equipment could not process the additional data, and upgrades would cost billions of dollars.

The public interest in the number crunch problem goes beyond mere conservation to include the national goal of encouraging competition in the local exchange market. If number resources are not managed so that incumbents and new telecommunications carriers have equal access to them, competition will be curtailed and consumers' choice of local telephone service providers will be drastically limited.

Objectives of a Solution

A solution to the number crunch must be found that minimizes consumer dissatisfaction resulting from the number crunch and maximizes the development of local exchange service competition by increasing the efficiency with which NXX codes are assigned and utilized.

Factors Affecting the Number Crunch

1. Wireline and wireless telephone companies cannot provide their telephone services to a consumer unless each company can assign a telephone number to the customer.
2. Consumer demand for telecommunications services that require the assignment of a telephone number will continue to accelerate, requiring new NXX codes to be assigned to carriers on a regular basis.
3. If new Competitive Local Exchange Carriers (CLECs) are required by regulation, market pressure or technical limitations to match the rate centers established for billing purposes

by the Incumbent Local Exchange Carriers (ILECs) and if each CLEC requires a complete NXX code (10,000 numbers) for each rate center just to serve a handful of customers, then new area codes will have to be opened simply to make NXX number blocks available.

4. If the supply of NXX codes is exhausted prematurely, local exchange competition will not develop to the extent needed to create fully competitive local exchange markets, and enormous unnecessary costs will be placed on all telecommunications providers and their customers.
5. One way to conserve numbers is to assign one NXX code to more than one rate center.
6. While ILECs have been able to store large reserves of numbers through growth codes, entrants in many instances have had trouble obtaining any numbers to serve consumers in certain rate centers. Because ILECs have a strong business incentive to constrain the development of effective local exchange competition, they may wish to retain the existing inefficient system of assigning and utilizing NXX codes so as to impair fair competition.
7. Assigning one NXX code to more than one rate center would give new entrants greater flexibility to extend their facilities-based services to additional customers, which would also give resellers of local exchange services more options.
8. The public interest demands that the development of effective local exchange competition not be constrained by the availability of telephone numbers, and entry of Regional Bell companies into long distance markets -- predicated on such competition -- should not be permitted until the number crunch has been eased with an interim solution.

TCG's Number Crunch Solution

1. Each new NXX code (10,000 numbers) will be assigned to one LEC (ILEC or CLEC) to be used in one area code.
2. In addition, numbers in each new NXX code will be assigned only to locations within the geographic area served by one E911 Tandem.
3. The LEC may create up to ten NXX subsets (blocks of 1,000 sequential numbers) from each NXX code and assign one or more NXX subsets to each traditional rate center so that one NXX code could be used in as many as 10 rate centers.
4. The NXX subsets will be assigned generally to contiguous rate centers or other logical groupings such as neighborhoods. This will allow the full NXX code to serve a community of interest, thereby lessening customer confusion and enhancing consumer awareness. And to accommodate carriers that don't rate calls on such fine geographic distinctions (i.e., long distance carriers' "postalized" (flat) rates), a single rate center can be established to collectively represent all the NXX subsets.
5. Each NXX subset of 1,000 numbers will be associated with an *existing* NXX code fully assigned to the same rate center (typically an ILEC code) so that *existing* switching and billing systems can function on the basis of the *existing* NXX code. This will minimize costs to establish toll discrimination and conduct the rating process for IXC's, operator services, pay phones and customer premises equipment (PBXs).

6. A central distribution center will be established to implement and administer the proposed number assignments, as well as all future modifications, in a competitively neutral manner. Bellcore has a proposal pending to satisfy this requirement.

Benefits of TCG's Solution

1. This low cost and low risk billing system solution primarily affects off-line, batch processes. Call routing and completion are not affected.
2. The TCG solution is modular and permits selective implementation by each carrier, depending on its specific circumstances. Large carriers could use entire NXXs in one rate center while smaller carriers "spread" the NXXs over several rate centers.
3. TCG's solution can be implemented within 6 months.
4. TCG's solution will be a synergistic foundation for Service Provider Number Portability with number pooling when it becomes a reality (1998 and beyond).
5. TCG's solution is intended to be interim and to be used in combination with other solutions, including rate center consolidation and the ultimate full number portability with number pooling.

Background of TCG's Number Crunch Solution

In the fall of 1995, the California Public Utilities Commission (CPUC) heard testimony regarding whether new Competitive Local Exchange Carriers (CLECs) should be required to match rate

centers of existing Incumbent Local Exchange Carrier's (ILECs). Rate centers are geographic points defined by longitude and latitude. Carriers determine charges for telephone calls based on the distance between the rate centers associated with the call. The name of the rate center in which a call terminates -- not necessarily the municipality where the called party actually resides -- is the location that consumers see on their bills.

One concern in California was that if carriers utilize different or inconsistent rate center designations, it would be difficult for consumers to compare rates. Consumers could be confused when the "name" of the called location changes depending on the carrier. CLECs strongly expressed the concern that they may not be able to compete effectively with the ILECs if consumers were confused or unable to easily make rate comparisons. Additionally, CLECs are hesitant to create a situation where ILEC customers calling the CLEC's customers may be billed incorrectly.

To match ILEC rate centers, however, each CLEC would need an entire NXX code (10,000 numbers) in each rate center it served, even if it only had one or two customers in that rate center. This would waste tens of thousands of telephone numbers. Testimony demonstrated that a rate center matching requirement applied to the expected number of CLECs operating in many of the almost 600 ILEC-defined rate centers in California would consume substantial quantities of NXX codes and result in the rapid and unnecessary exhaustion of available telephone numbers.¹

In February 1996, the CPUC ruled that CLECs do not have to match existing local telephone company rate centers. However, this did not solve the problem, for two reasons:

¹ It was estimated that the costs associated with establishing the required new codes in every carrier's switches would be significant. Recommendations were made that each carrier should bear its own costs although some ILECs made the anti-competitive suggestion that CLECs should pay for ILECs' costs. The California Public Utilities Commission ("CPUC") recently rules in Decision 96-12-067 (December 20, 1996) that no explicit charges should be imposed on carriers for recovery of costs of NXX code openings. The CPUC concluded that each carrier should treat its own NXX code opening costs as part of its normal cost of business.

First, the ILECs were not prepared with a solution that would allow them to properly rate calls from their customers to customers of a CLEC that was not matching the ILEC's traditional rate centers.

Second, CLECs were concerned that they would not be able to compete effectively with ILECs on the basis of price -- particularly for the residential consumers -- if the consumers could not easily make an "apples to apples" price comparison.²

Unnecessary Number Exhaust is an Endemic National Problem

Numbers are being used up prematurely all over the United States, not just in California. And number exhaust due to inefficient assignment and utilization of NXX codes is not just a problem in urban markets: it can be an even greater problem in rural areas. Low-density areas with only a few customers may consume a substantial quantity of NXX codes for rating purposes. For example, a rural ILEC with 35 rate centers may use 35 NXX codes -- 350,000 telephone numbers -- to serve only 3,500 customers. If a new rural CLEC attempts to match the ILEC's rate centers, it would consume another 35 NXXs -- perhaps to serve only 350 customers -- and exhaust the area code.

Number Allocation is as Important as Number Conservation

It is hard to imagine a more wasteful method of allocating a finite resource -- and as a practical matter, numbers are virtually a finite resource, because the cost associated with upgrading

² And when one CLEC actually attempted to use an NXX code more efficiently in a number of ILEC rate centers, the ILEC would only allow the CLEC's customer to be listed in the telephone directory associated with the traditional rate center, causing additional customer confusion and making the CLEC's service less attractive to consumers.

telecommunications equipment to enable it to process telephone numbers with additional digits is enormous. The need to do so for efficiency's sake should be postponed as long as possible.

The national problem is not merely a resource *conservation* problem, however. It is also and even more importantly an *allocation* problem. If CLECs cannot obtain sufficient telephone numbers in areas that they choose to do business or if numbering issues impair CLECs' service offerings, the fundamental purpose of the 1996 Telecommunications Act would be frustrated. That purpose is to foster competition, particularly facilities based competition, in the local exchange market. But CLECs are more disadvantaged than ILECs when an area code "jeopardy" is declared by the code administrator (currently the ILEC). ILECs typically have large number reserves through growth codes -- reserved numbers that are not yet in use, and may in fact never be used by ILECs. But CLECs may not even get adequate number resources to enter a market. For example, in California alone, seven codes are in jeopardy,³ and numbers in five area codes are being rationed through a lottery process where only two to four codes may be allocated to a carrier in a given month even where 10 to 20 codes may have been requested by the carrier.⁴

An Interim Solution to the Number Crunch Must be Adopted Nationally

In May 1996, TCG's White Paper, "*The Number Crunch*", proposed an interim and practical solution to the number exhaust problem, focusing on eliminating the additional stress placed on number resources by CLECs' need to match ILECs' existing rate centers. TCG's proposal was

³ The area codes in jeopardy are 310, 415, 510, 562, 619, 714 and 760

⁴ NXX codes are currently being rationed among competitors in the following area codes: 310, 415, 562, 619 and 714. TCG also faces rationing of numbers in area codes in Massachusetts (617), New Jersey (201) and Pennsylvania (617). In addition, TCG anticipates trouble even entering Ohio markets (513) due to number shortages.

considered at workshops sponsored by the California PUC as well as by the Rating and Routing Workshop of the Industry Carriers Compatibility Forum (ICCF) beginning in February 1996.

Unfortunately, the telecommunications industry has not yet issued any recommendation for a solution to the number crunch. Therefore, TCG here addresses the concerns raised by members of the telecommunications industry and policy makers to TCG's earlier proposal. The telecommunications industry can and should adopt this workable interim solution in the immediate future.

TCG's "Number Crunch Solution" (Revised and Updated)

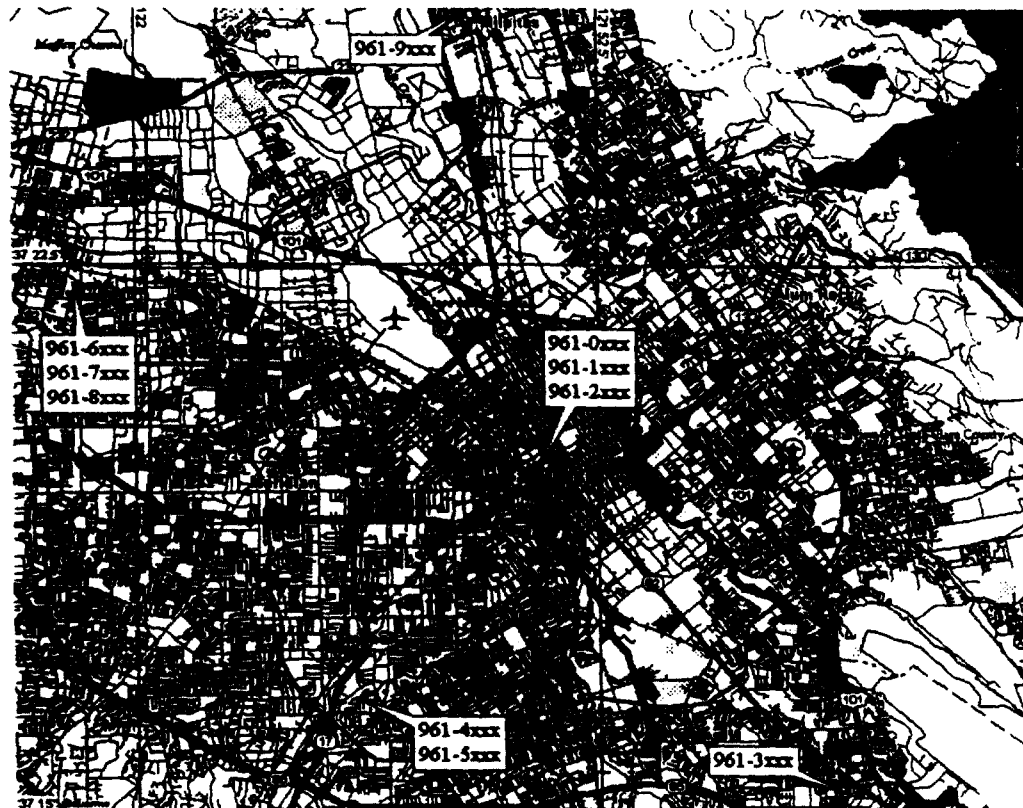
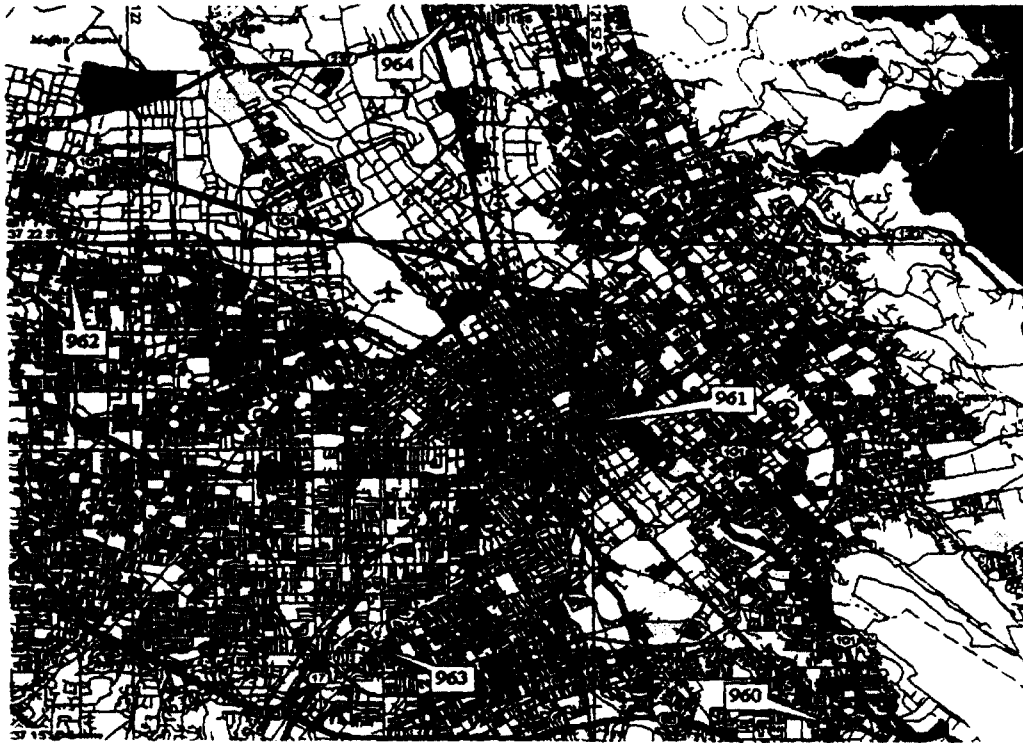
TCG's proposal is intended to be an immediately implementable interim solution that is both *practical and simple*. TCG believes that the permanent solution will be found in the area of true number portability with number pooling. Until a permanent solution is achieved, however, an interim plan is needed that will both solve the immediate crisis and facilitate migration to the permanent solution when it is defined.

The key to TCG's "Number Crunch Solution" is the development of a sub-file in Bellcore's Terminating Point Master (TPM) file process that would allow the 10,000 numbers in each NXX code to be used across multiple rate centers (up to ten) without impairing any carrier's ability to rate and bill calls accurately. The TPM allows a carrier's billing system to associate the originating and terminating telephone numbers involved in a call with a rate center and the "V&H" coordinates of that rate center so that the carrier's billing system can then calculate the distance of the call and then apply the appropriate time and distance charges to the call.

The following assumptions and constraints apply to this solution:

1. Each new NXX code (10,000 numbers) will be assigned to one LEC (ILEC or CLEC), in one area code and within the geographic area served by one E911 Tandem.
2. The carrier may create up to ten NXX subsets (blocks of 1,000 sequential numbers) from each NXX code and assign one or more NXX subsets to each traditional rate center so that one NXX code could be used in as many as 10 rate centers.
3. The NXX subsets will be assigned generally to contiguous rate centers or other logical groupings such as neighborhood boundaries. This will allow the full NXX code to serve a logical community of interest, thereby lessening customer confusion and enhancing consumer awareness. And to accommodate carriers that don't rate calls on such fine geographic distinctions (i.e., long distance carriers), a single rate center can be established to collectively represent all the NXX subsets.
4. Each NXX subset of 1,000 numbers will be associated with an existing ILEC NXX code fully assigned to the same rate center and so designated in the LERG and other relevant databases so that existing switching and billing systems can function on the basis of the existing NXX code, thereby lessening the complexity and cost to establish toll discrimination and conduct the rating process for IXC's, operator services, pay phones and CPE equipment.
5. A central distribution center will be established to implement and administer the proposed enhancements, as well as all future modifications, in a competitively neutral manner. Bellcore has a proposal pending to satisfy this requirement.

On the following page are two maps that together demonstrate how the TCG Number Crunch Solution will alleviate number exhaust. The top map represents the status quo, where a market entrant uses five NXX codes to serve five separate rate centers, although one NXX code may contain enough numbers to serve all of the entrant's customers in the short term. The bottom map represents the same entrant serving the same customers using TCG's Number Crunch Solution. In the second scenario, where 1,000 number blocks are assigned to the individual rate centers, only one NXX code is needed.



Operating TCG's Number Crunch Solution

The operation of the Number Crunch Solution across NXXs requires relatively minor adjustments. Associating an NXX subset with an existing NXX that is assigned only to one rate center will allow carriers to rate calls based on the V & H (geographic latitude and longitude) coordinates of the existing rate center. Each company that generates bills can modify its billing system to accomplish the following two major tasks:

1. When the Terminal Point Master (TPM) update file is received from Bellcore, the structure of the billing company's production TPM would be altered, if its rate structure so requires, to allow for a segmentation of the NXX codes. For carriers with distance-sensitive rates, the updated records will allow the billing company to build a TPM file with each of the NXX subsets. But if the carrier's rate structure doesn't require fine geographic specificity (i.e., for region-specific or postalized rates), a single rate center can be established to represent the subsets collectively. Companies that have enough customers in a rate center to efficiently utilize the entire NXX (i.e., larger ILECs) will have no need for the geographic granularity made possible by the TCG Number Crunch Solution, and will have no need to change their process.
2. The billing company will modify its billing system/rating system to access the new TPM file to obtain the proper rate center assignment. This will allow for the proper rating of calls for those companies that require the exact rate center V & H designation.

Database Requirements

The database structure changes are in the resulting production TPM created by each company from the updates received from Bellcore. Each company will need to modify the database structure in its billing system to accommodate this new data. If a company chooses not to utilize the new data, the current TPM build process would need the capacity to ignore the new records.

Call Rating

After the TPM update is received from Bellcore, an updated production TPM must be generated to conform to each company's billing and rating system. Each company's rating system must then be modified to recognize the new data that is required for the rating process. This can be as simple as recognizing the existence of the data and then accessing the data. From that point on, the rating process should progress as it does today.

Toll Discrimination/2-PIC

The problem of toll discrimination and 2-PIC rating and identification can be accommodated by the utilization on an "equate" field in the TPM which would associate the 1,000 number NXX subset to an existing ILEC NXX code.

E911 Emergency Services

To maximize trunking efficiency and avoid any possibility of affecting E911 service, TCG's solution functions within the constraint that NXX subsets from the same NXX are not assigned to areas served by different E911 Tandems.

Number Portability

The TCG proposal does not substitute for Service Provider Number Portability (SPNP) in any way. Rather, it serves to reduce the consumption of NXXs and area codes, and thereby delay NXX code exhaust within area codes (NPAs) by allowing more efficient use of new NXXs than current techniques. True number portability with number pooling, when available, will allow additional number assignment efficiencies by supporting the continued use of existing number assignments

across all LECs (CLECs and ILECs), rather than requiring new number assignments when customers change carriers. In addition, the TCG proposal serves to support location portability, at least within a rate center.

Impact on Service Providers

Some service providers fear a negative impact from TCG's Number Crunch Solution. TCG believes that any such concerns can be mitigated.

Operator Services

The potential negative impact on the operator services platforms is mitigated by the utilization of the "equated" NXX assignment (i.e., associating the NXX subset with an established NXX). The Operator Services platforms would need to be modified to perform this equate function.

Pay Phone Providers

Representatives of the pay phone industry have expressed mixed reaction to the TCG solution. The implied expansion of NXX rating points to accommodate CLEC rate center matching may have substantial impact on the capacity of the phone's storage and call rating capacity. The utilization of the "equated" NXX assignment may lessen the impact of TCG's solution. Storing the equated NXX-to-NXX subset data is still a memory issue for them. One solution may be to develop a weighted average rate based on calling patterns.

Interexchange Carriers

The IXC's rating strategy will determine the requirements for modifications to accommodate new TPM data. The IXC may choose to rate their call to a given area with less granularity than is defined by the current rate center structure. IXCs will not experience any harm from TCG's solution. With the utilization of postalized rates by the IXC, the TCG solution is not a concern of the carrier and their systems should ignore the new granularity capability.

ILECs

If the ILEC's local calling rates are distance-sensitive, the ILEC will have to modify its billing system to rate local calls on the basis of the rate centers associated with NXX subsets. However, the complexity of this function is simplified by "equating" a CLEC's NXX subset with one of the ILEC's existing NXX's that is assigned to the same rate center.

PBX Automatic Route Selection

Automatic Route Selection (ARS) support that is programed within the PBX systems would have to be modified to take advantage of the new degree of granularity available with the multiple rate center assignments. The utilization of the "equated" NXX assignment may minimize the impact on PBXs in much the same way that it facilitates the pay phone rating systems. Older PBXs may not be capable of achieving this routing granularity, or of using the "equated" NXX function. However, that only means they are potentially less than optimally routed.

Benefits of TCG's Solution

TCG proposes a low cost, low risk billing system solution, primarily affecting off-line, batch processes. By contrast, other possible solutions to the number crunch problem may require expensive, complex and possibly risky modifications to on-line, traffic-carrying switches.

The TCG solution is modular and permits selective implementation by each carrier, depending on its specific circumstances. For example, large ILECs that efficiently utilize a complete NXX code per rate center would not need to change anything in their own NXX code assignment process and would only need to add the ability to correctly rate calls to the new NXX subset number blocks. This rating can be accomplished easily by a simple translation process that "equates" an NXX subset with an established NXX code.

Utilization of the NXX subsets in more than one rate center would be used by carriers that are not expected to utilize a complete NXX code in one rate center.

TCG's solution will be a synergistic foundation for Service Provider Number Portability with number pooling when it becomes a reality (1998 and beyond). TCG's solution should facilitate a smooth migration to number portability.

TCG's solution can be implemented within 6 months. TCG's solution is intended to be interim and to be used in combination with other solutions (e.g., rate center consolidation).

Conclusion

TCG's solution to the number crunch will most efficiently preserve scarce numbering resources and fairly allocate numbers so as to promote the development of facilities-based and resale local exchange service competition with minimum cost or difficulty.

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Other TCG Issue Papers

Arbitration Results: *The Runs, The Hits, and The Errors* (November 1996)

Arbitration: *The End Game* (June 1996)

The Number Crunch: *A TCG Solution* (May 1996)

Performance Standards: *Key To Interconnection* (April 1996)

Effect of Resale on Facilities-Based Competition in the Local Exchange Market (November 1995)

Interconnection Compensation - The Critical Issue for Local Exchange Competition (October 1995)

States at the Forefront in Making Local Telecommunications Competition Legal (August 1995)

The Economics of Interconnection (By Gerald Brock) (April 1995)

Universal Service Assurance II: *A Blueprint for Action* (November 1994)

CompLECS & Universal Service Assurance: *How Competition Will Strengthen Universal Telephone Service* (August 1994)

Whither the CAPs? (June 1994)

The Unlevel Playing Field: *Asymmetric Market Power Demands Asymmetric Regulation* (March 1994)

Universal Service Assurance: *A Concept for Fair Contribution and Equal Access to the Subsidies* (December 1993)

The "Pot Bay": *Phase II, Ameritech Takes a Step in the Right Direction* (November 1993)

Telco Fiber Fiascos: *Will Accelerated Infrastructure Programs Be the Next Nuclear Power Plant Debacles?* (July 1993)

The "Pot Bay": *Several BOCs Attempt to Obstruct Interconnection...Again* (June 1993)

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